

# WCET Challenge 2008: Participation

<u>Tool</u>	<u>Source</u>	<u>Type</u>	<u>ARM7/iF-DEV</u>
<b>participating</b>			
Bound-T	Tidorum	static	yes
Chronos	NUS	static	yes
Heptane	IRISA	static	yes
MTime	TUW	hybrid	yes TBC
OTAWA	IRIT	static	yes
RapiTime	Rapita	hybrid	yes
TuBound	TUW	static	no
<b>not participating</b>			
aiT	AbsInt	static	
SWEET (?)	MdU	static	
SymTA/P	IDA	hybrid	
TimeBounder	KAIST	static?	

# WCC 2008: Benchmark quality

- More portable C code
  - use “typedef” with C99 standard-sized types
    - eg. “uint\_least8\_t” when the range 0 .. 255 is enough but a wider range is acceptable
  - suits both 8-bit machines and wider machines
- Separate test data from general code
  - favour functions with parameters, not global data
  - but must still embed test data in program
    - for running on real HW without inputs
- Concentrate on “core” tests
  - deprecate the small or special cases
  - try to find more realistic benchmarks
  - PapaBench?

# WCC 2008: New benchmarks

- DEBIE-1 DPU SW, courtesy Space Systems Finland
  - instrument control SW; DEBIE-2 now on Columbus/ISS
  - C, 9 source files, 8758 lines, 1710 statements ( ; )
  - three ISRs, three non-ISR threads, deadlines
  - original target 80C32, now portable, eg. ARM7
- Loops and arrays, courtesy Saarland University
  - stress tests for both I- and D-cache analysis
- New benchmark from Mälardalen
  - TBD
- New benchmarks from Vienna
  - TBD
- PowerBench?
  - suggested by IRISA

# WCC 2008: Benchmark format

- Define standard analysis tasks
  - WCET of **this** function in **this** context
  - need differential analysis? wrappers?
- Define standard table template for results
  - more easily comparable across tools
- Define analysis tasks for pure flow analysis (how?)
  - eg. SWEET participation
  - how to compare with results of WCET analysis?
  - eg. “what is the maximum number of invocations of *foo*, assuming that the WCET of *foo* is arbitrarily large?”
    - forces WCET analysis to report its flow analysis
    - thus comparable with pure flow analysis
- Instrument with RapiTime

# WCC 2008: Suggested common target

- iSYSTEM iF-DEV, € 69,00
  - ARM7, NXP LPC2138
    - 512 KiB flash on chip
    - 32 KiB SRAM on chip
  - USB/JTAG
  - WinIDEA IDE, GCC
- No cache, but ...
- Cache-like flash buffers:
  - prefetch buffer, 128 octets
  - branch target buffer, 128 octets
  - data buffer, 128 octets
- Flash buffers can be disabled
  - constant memory access time (TBC)



# WCC 2008: Organization, schedule

- Steering/working group
  - Niklas Holsti, Jan Gustafsson, Guillem Bernat, ...
- Reference group
  - planned to consist of independent, external people
  - industrials (potential tool users) welcome
  - ... delayed...
- March-May benchmarks progressively available
- mid-June closing date for results to be reported at WCET Workshop
- July report at WCET Workshop
- ... website remains open for new benchmarks and results... for next Challenge